

**WHAT IS CLAIMED IS:**

1. A wireless communication receiver, comprising:
  - (a) a processing unit that processes received signals and filters the processed signals in an analog domain to output filtered analog signals;
  - 5 (b) an analog-to-digital converter (ADC) that converts the filtered analog signals into digital signals; and
  - (c) a digital filter that filters the digital signals from the ADC and attenuates residual interferers in the digital signals by a predetermined amount, so as to allow relaxation of tolerable quantization noise generated by the ADC to a 10 pre-defined level to thereby substantially reduce a dynamic range of the ADC;  
wherein the ADC has a word length corresponding to the reduced dynamic range.
2. The receiver of claim 1, wherein the pre-defined level is higher than a level prescribed by the receiver's sensitivity.
- 15 3. The receiver of claim 1 or 2, wherein the pre-defined level of the quantization noise is maintained within a range, such that the total interference of the receiver is kept at a level not greater than an allowable level.
4. The receiver of claim 1, 2 or 3, further comprising a demodulator that demodulates the filtered digital signals from the ADC to recover user data.

5. A method for use in a wireless communication receiver, the method comprising the steps of:

processing received signals;

5 filtering the processed signals in an analog domain to output filtered analog signals;

converting the filtered analog signals into digital signals; and

10 filtering the digital signals in a digital domain to attenuate residual interferers in the digital signals by a predetermined amount, so as to allow relaxation of tolerable quantization noise generated at the converting step to a pre-defined level to thereby substantially reducing the number of quantization bits required at the converting step;

wherein the converting step converts the filtered analog signals into the digital signals with a corresponding reduced number of quantization bits.

6. The method of claim 5, wherein the pre-defined level is higher than a 15 level prescribed by the receiver's sensitivity.

7. The method of claim 5 or 6, wherein the pre-defined level is maintained within a range, such that the total interference of the receiver is kept at a level not greater than an allowable level.

8. The method of claim 5, 6 or 7, further comprising a step of 20 demodulating the filtered digital signals to recover user data.